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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
Federal Communications Commission
Washington, D.C. 20554

In the matter of:	)	
	)	
Amendment of the Rules to Permit	)	RM-8308
Use of the Band 76-77 GHz for	)	
Vehicle Radar Systems	)	

Comments of Ford Motor Company

Ford Motor Company ("Ford"), by its attorneys, hereby comments on the above-captioned Petition for rulemaking filed by General Motors Research Corporation ("GM").[1] GM's Petition proposes the allocation of 1 GHz of spectrum between 76 and 77 GHz for automobile radar systems. Ford is an enthusiastic supporter of automobile radar, and has been working on similar systems at this and other frequencies. It is beyond doubt that the widespread deployment of vehicle radar systems could improve driver safety and automotive efficiency and, thus, would serve the public interest.

Regrettably, however, GM's Petition fails to provide significant engineering details and does not address critical regulatory issues. As such, the Petition fails to supply the Commission with the information necessary to proceed to the adoption of

[1] The FCC called for comment on the Petition by Public Notice Rep. No. 1957 (Aug. 2, 1993).

rules. Accordingly, Ford is committed to efforts to supply the FCC with more complete information and proposed rules.

I. INTRODUCTION

Automakers throughout the world have long recognized that the application of modern telecommunications technology to motor vehicles has the potential to revolutionize the way we drive. Already, microprocessors have fundamentally altered automotive electrical systems and engine control. Ford and other motor vehicle manufactures have been introducing, and will be introducing over the next several years, additional RF-based systems to enhance an automobile's security, reliability, performance and safety.

One of the most exciting applications of telecommunications in automobiles is the potential for collision-avoidance radar. Vehicle radar is designed to be installed in trucks and automobiles to warn the driver of objects in the vehicle's path. Ultimately -- perhaps several years away -- vehicle radar systems may be designed automatically to respond to detected objects. Experimental concepts -- many years in the future -- might actually permit automatic steering and piloting of automobiles and trucks. Obviously, vehicle radar has enormous potential to enhance vehicle operational safety and improve automobile drivers' performance.

Until now, progress on collision avoidance radar has been slow. As the Commission will remember, it authorized on a waiver basis a limited system operating

at 24 GHz almost a decade ago.[2] That system, however, never has been implemented on any widescale basis. More recently, however, automakers throughout the globe have been investigating more technologically advanced systems and other spectrum. For example, European automakers are known to be working at 76-77 GHz, the subject of the instant Petition. By contrast, the Japanese are investigating spectrum near 60 GHz.

Here in the United States, Ford, GM and Chrysler each have programs to investigate and develop automobile radar. Ford has its own design and development effort underway looking at several frequencies and several approaches. GM and Chrysler no doubt have similar efforts. In addition, however, Ford, GM and Chrysler have been working together with the American Automobile Manufacturers Association (AAMA) on this topic. Specifically, a subcommittee of the AAMA was formed in March of this year to investigate and support joint efforts towards frequency selection, band requirements and inter-system compatibility.

GM's Petition seeks an allocation for one particular system at one particular frequency. Ford believes that the proper approach for the automotive industry would be to accommodate all the needs of the public for the various automotive radar systems that are being investigated and demonstrated. Thus, Ford -- either through the AAMA or independently -- will submit supplemental technical and regulatory information to assist the Commission in the rulemaking process.

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[2] *See Vehicle Radar Safety Systems, Inc.*, 100 F.C.C.2d 1598 (1985), *waiver extended*, 2 F.C.C. Rcd 3698 (1987).

II. DISCUSSION

The Commission's rules set forth what must be included in a Petition for rulemaking:

> the text or substance of the proposed rule. . .together with all facts, views, arguments and data deemed to support the action requested, and. . .how the interests of Petitioner will be affected.[3]

The Commission requires this data because it must, when allocating spectrum to a new service, make a determination that the public interest would be served by use of the spectrum as proposed.

GM's ten page Petition fails to meet these requirements, and thus is incomplete as its stands. Moreover, and perhaps most importantly, the Petition only touches the surface of the issues it raises regarding automotive radar. Significantly, these issues should be explored further before the Commission moves forward -- as it should -- to allocate spectrum for this important service and to adopt authorization procedures.

For example, most plainly, the GM Petition fails to include a draft of the rules it proposes the Commission adopt. Obviously, the Petition seeks the allocation of a particular block of spectrum. Normally, however, the agency will not allocate spectrum for a particular service before concluding that the service is in the public

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[3] 47 C.F.R. § 1.401(c) (1992).

interest. Unfortunately, even given the strong public interest in automotive radar and spectrum therefor, GM has failed to make its case.

Similarly, the GM Petition is bereft of detailed engineering "data" regarding its proposed operation. The Petition contains no details whatsoever about how the radar it proposes to use would work.[4] Nor does the Petition include anything but the most cursory analysis of the system's interference potential or its ability to withstand interference. Indeed, no emission limits are proposed. The Commission requires more before decisions to allocate one gigahertz of spectrum can be made.

Moreover, the Petition implies that GM proposes to use a proprietary technology for its radar system.[5] The Communications Act, of course, requires that spectrum be dedicated to uses that serve the public interest, not solely the private interests of licensees.[6] Historically, therefore, the Commission has been wary of allocating limited spectrum resources for use by a single entity's private, secret or patented technique. Accordingly, if GM is relying on a particular technology to support an allocation of spectrum, it is incumbent on the Commission to insist on public inspection and examination of the technology before any allocation is made.[7]

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[4] The Petition does note that the radar GM proposes would use FM-CW modulation. Petition at 8.

[5] *See* Petition at 9 (referring to a "proprietary modulation scheme").

[6] 47 U.S.C. §§ 151, 301, 303(g), 304, 308(b), 309(a) (1988).

[7] For this reason, before any spectrum can be assigned, GM's experimental license, granted for tests at 60 GHz, *see* Petition at 4, currently being kept confidential, should be made available to the public.

Still worse, the Petition wholly omits any discussion of the proposed regulatory structure for automotive radar. GM does not address compatibility with other systems or the ability to accommodate multiple, open entry. GM's Petition does not disclose how, or if, other automobile manufacturers could use 76 GHz spectrum for their radar systems. Because other entities can be expected to manufacture vehicles with radar systems -- operating in this or other bands -- these issues must be fully explored before any allocation is made.

Similarly, the Petition is remarkably opaque about the licensing scheme it proposes for the new service. Other than a fleeting mention of "Parts 2 and 15" in the Petition's summary, GM does not disclose how it proposes the Commission assign licenses in the proposed new band or, indeed, whether users would be licensed at all. Substantially more information is required before the Commission can determine that the proposed allocation is in the public interest.

As noted above, Ford is also investigating automotive radar in frequencies above 25 GHz. Specifically, Ford is investigating spectrum at 76-77 GHz, 92-93 GHz, and 140-141 GHz for forward-looking pulsed radar systems and 33-34 GHz for side and rear-looking systems. Until now, Ford, together with GM and Chrysler, has been participating in AAMA activities designed to formulate joint spectrum requirements among U.S. automakers. Substantially more complete information will result from either or both of these efforts, probably before the end of 1993.

Ford submits that the Commission should begin the process of making an allocation for automobile radar. However, the Commission should include *all* the bands listed above in any proposals it might be contemplating, and seek comment on proposed technical criteria and licensing or authorization schemes. In the interim, Ford will assist the Commission by supplementing the record with additional details when available. In that way, the appropriate spectrum requirements will be ascertained, and spectrum available by the time vehicle radar is implemented in the near future.

III. CONCLUSION

Ford concurs with GM's view that automobile radar offers enormous potential to make driving safer and easier. Soon, spectrum will be needed to accommodate these systems. Regrettably, however, GM's Petition fails to provide sufficient data necessary to support any allocation of spectrum, much less specifics regarding its choice of 76 GHz. Accordingly, Ford will undertake to supplement this information in the near

future. Should the Commission begin to ponder automobile radar allocations, Ford recommends that it include all of the currently contemplated radar bands, and seek comments on the various options and technical proposals.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this 1st day of September, 1993, I caused copies of the foregoing "Comments of Ford Motor Company" to be mailed via first-class postage prepaid mail to the following:

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